(54) Title: TV WITH URL RECEPTION FOR INTERNET ACCESS

(57) Abstract

A display system receives (83) a data stream having successive image frame data in frame regions and Internet Universal Resource Locator (URL) data and association data in data regions between frame regions, and displays on a display monitor successive frames derived from the image frame data. The association data associates one or more image entities in successive frames with one or more URLs, and a viewer, by selecting (99) an associated image entity in the display, causes the system to access (103) the Internet, to connect to a source on the Internet associated with the URL, to download (109) a WEB page from the source, and to display (111) the WEB page in the display. The viewer may interact with the displayed WEB page to access further related information. Entities may be enhanced in the display to indicate association with the hidden URL.

In such integrated systems, whether in a single enclosure or as set-top box systems, user input is typically through a hand-held device quite similar to a familiar remote controller, usually having infra-red communication with the set-top box or a receiver in the integrated TV.

5   For computer mode, such as WEB browsing, a cursor is displayed on the TV screen, and cursor manipulation is provided by buttons on the remote. Select buttons are also provided in the remote to perform the familiar function of such buttons on a pointer device, like a mouse or trackball more familiar to computer users.

10   Set-top boxes and computer-integrated TVs adapted as described above typically have inputs for such as a TV antenna (analog), cable TV (analog or digital), more recently direct-satellite TV (digital), and may also connect to mass storage devices such as hard disk drives and CD-ROM drives to provide a capability for uploading video data from such drives

15   and presenting the dynamic result as a display on the TV screen.

The present inventors have noted that with the coupling of computer technology (digital) with TV, many capabilities familiar to computer users have been made available to TV users. For example, ability to provide text annotation for TV presentations is considerably

20   enhanced. Computer techniques such a Pix-on-Pix are now available, wherein separate TV presentations may be made in separate windows, or overlaid windows on the display screen. Separate windows may also support display from separate sources, such as an analog TV program in one window, a computer game in another, and a video conference in a

25   third.

Still, with all of the digital techniques made available, an essential separation still remains between the computer world and the dynamic TV world. Consider, for example, how a need or desire for information occurs to an end user. A person watching a TV program identifies with a

30   particular performer. The viewer may not remember the performer's name, but might be very interested for a time in recalling the name, and even in gathering further information about the actor or actress.

Conventionally in this situation, the viewer can wait until the end of the program, where the credits are typically displayed, usually

35   unreadable, note the name of the performer, then (assuming an integrated system) switch modes to Browse, access the WWW, and search the performer's name, the studio name, the program name, or some other

criteria. to seek the desired information. If the information desired is available somewhere in a WEB page or related database. the user may. after some effort, be able to satisfy his/her desire for the information.

One more simple example should suffice.   Given a TV

5   advertisement, a viewer may be thoroughly enamored by an advertisement for a particular item such as an automobile. and wish to purchase the item or one much like it. Given the cost of network television advertising. and the necessary time limitations imposed on purchasers of advertising time as a result, the depth of information provided about purchasing an

10   advertised item is necessarily limited. Certain salient features may be provided. typically those that an advertiser presumes will attract a purchaser, and some general pricing information may be provided as well.

Assuming an automobile advertisement as an example. full detail of options, models, availability, pricing and financing details. and where

15   one might go locally to examine and test drive a model of the car could not be provided. Moreover. even if full detail were provided. the viewer would have a hard time trying to write it all down for future use. See, for example, the fine print on automobile lease advertisements.

In most cases a viewer sold by a TV advertisement has to make

20   some determined effort to actually complete a purchase of the advertised item. except for the questionable case of TV shopping channels. which are not presumed by many to be credible.   Moreover, many major manufacturers do not offer products to be sold by the conventional phone-in TV shopping technique.

25   What is clearly needed is a further integration of the techniques of WEB browsing and TV transmission to provide a method and apparatus for a viewer to very quickly garner maximum information about entities of interest seen in TV transmissions. A method allowing a viewer to quickly and easily access information in detail about products advertised at a more

30   general level, and about people and things of interest identified in TV transmissions.

Summary of the Invention

35   In a preferred embodiment of the invention a varying signal for providing a display on a display monitor is provided. comprising a first region comprising image information for a single frame for the display;

and processing circuitry; an Internet browser; display circuitry; and a
display monitor. The receiving and processing circuitry receives a data
stream having image frame data and an Internet Universal Resource
Locator (URL) identifying an Internet source and provides the image
5   frame data to the display circuitry and the URL to the control circuitry.
The display circuitry provides a display on the display monitor from the
image frame data, and the control circuitry accesses the Internet, causes
the Browser to access the Internet source, and downloads and displays a
WEB page from the Internet source.

10   In this receiving and display apparatus the URL is associated with
a specific entity image in the display. There may also be multiple URLs
associated each with a different specific entity image in the display. The
WEB page retrieved is displayed as a movable and adjustable window in
the display in a preferred embodiment, but may also be displayed in place
15   of the previous display.

         In another aspect of the invention a signal preparation and
transmission apparatus is provided comprising imaging apparatus for
monitoring a scene and preparing a signal data stream therefrom, the data
stream comprising image frame data; and control circuitry adapted for
20   adding an Internet Universal Resource Locator URL to the data stream
and for associating the URL with an image entity in one or more of the
image frames. There may also be more than one URL each associated
with a different image entity. Visual enhancement of the image entity in a
display provided by the data stream may be provided as well, such as by
25   one or more of adjusting brightness, contrast, or color.

         In another aspect a method is provided for association of an entity
in a broadcast image with an Internet Universal Resource Locator (URL),
comprising steps of (a) preparing a data stream having frame data regions
comprising sequential frame data from a scene using a visual imaging
30   apparatus; (b) inserting data for the URL in second regions between the
frame data regions; and (c) inserting data relating the URL to a specific
entity in an adjacent frame data region in the second regions between the
frame data regions.

         In this method steps (b) and (c) may be steps performed in editing
35   pre-recorded image data, or, alternatively, steps performed automatically
in a live broadcast by computerized apparatus coordinated with the visual
imaging apparatus. There may additionally be a step for inserting data in

Brief Description of the Drawings

Fig. 1 is a block diagram of a set-top box as may be used as a platform for practicing the present invention.

Fig. 2A is an exemplary TV display according to an embodiment of the present invention.

Fig. 2B is a representation of a data stream for transmitting a TV display in an embodiment of the invention as shown in Fig. 2A.

Fig. 2C is an exemplary display showing a WEB page in a window on a TV display as might be presented as a result of practicing the present invention.

Fig. 3A is a flow diagram depicting steps in preparing a TV transmission according to an embodiment of the present invention.

Fig. 3B is a flow diagram depicting steps in receiving a TV broadcast with a dynamic URL, in initiating access to a WEB page according to an embodiment of the present invention.

Description of the Preferred Embodiments

In embodiments of the present invention, individual images in TV presentations, such as persons, objects, and the like, are linked with Universal Resource Locators (URLs) in a manner that a viewer may select such images, and by so doing, invoke a linked URL, which leads to a WEB location providing information related to the image. In most embodiments of the invention an image related to a URL is enhanced in display, such as by a special color, an enhanced brightness (a halo), or an outline. Other forms of enhancement are possible as well.

Fig. 1 is a block diagram of a set-top box 11 as may be used for practicing the present invention. Set-top box 11 is more sophisticated and has more functionality than required for practicing the invention in some embodiments, but serves as a good example of the sort of platform that may be used.

In box 11 a decoder/tuner 13 receives signals from a variety of sources, such as a satellite link 15, a cable TV line 17, and a VCR input 16. An 80486 CPU 19 in this embodiment provides management and computing ability, and is connected to decoder/tuner 13 by link 21. In

of data flow, and are not meant to indicate the type or bandwidth of specific links. It is well known, for example, that CPUs of the sort described communicate on parallel buses with bus cycles controlled by bus controllers in an industry standard fashion, such as an ISA bus, an

5   EISA bus, and the like. Other sorts of communication links may be used, such as Universal Serial Bus (USB) and others.

In the set-top box of Fig. 1, VGA circuitry 33 has outputs links 20 and 22 for driving a TV 51 and/or a computer display monitor 53, and display in various embodiments may be made on either or both. There is

10   also an infra-red communicating remote 63 adapted for conventional remote functions and also for cursor control and selection by directional buttons 67 and selection buttons 69. Infra-red communication from remote 63 is to receiver 65 in the set-top box.

As is well known in the art, data stream transmissions made for the

15   purpose of presenting images on a display screen are sent in identifiable frames. This is generally true whether the origination is a stored (pre-recorded) data stream, or a live transmission, and whether the transmission is digital or analog. The specific technology in any case is very well known in the art, and not necessary to cover in detail in this specification.

20   In frame-by-frame transmissions, as is known in the art, it is known to transmit information in the space between frames. The format of digital transmissions allows for such data, and analog TV transmission has blank lines between frames which may also be used for data transmission within certain space and time limitations. Information for

25   colorizing black-and-white TV presentations is coded in this manner, as are special captions for hearing handicapped, for example.

In various embodiments of the present invention one or more entity images in frames of a transmission are identified as to position and extent in the frame, and are associated with a WWW URL. As a

30   simplified example, in an advertisement for a certain brand of automobile, an icon or emblem may be presented in each frame at a particular position in the frame. The emblem could be, for example, the specific emblem used for that brand of automobile, like the well-known Ford™, Chevrolet™, of BMW™ emblem. The emblem could be provided in the

35   advertisement in any of the conventional manners known in the art. Fig. 2A is a simplified depiction of a frame 55 displayed with a BMW emblem 57 in the frame at a particular position with a specific areal extent.

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integrated with the TV circuitry displays a cursor 70 on the screen which may be positioned by a user via positioning buttons 67 on hand-held remote 63 (see Fig. 1). In other systems. cursor control may be accomplished by a pointer device or in another convenient manner.

5   Continuing with the example of the BMW advertisement. as the TV frames are displayed, which includes BMW emblem 57. a viewer may activate the cursor (cursor may activate automatically when the viewer manipulates one or another of buttons 67). Following special control routines according to an embodiment of the invention, data between
10   frames is stripped and used in execution of the control routines to identify the position and areal extent of emblem 57 in the adjacent frames. and the associated URL.

If the viewer is interested in additional information. he/she may manipulate the cursor to touch the region of emblem 57 and then actuate a
15   selection signal, such as pressing one of the buttons 69 on the remote. On receipt of the selection signal with the cursor touching the BMW emblem. the system executes browser routines, accessing the WWW, and dials up the WEB server (see server 54 and modem 35 or 39, Fig. 1) described above maintained by BMW on the WWW. The URL in the data region
20   between frames of the TV transmission. associated with the BMW emblem is the WWW address for dial-up.

Once a viewer activates the system of the invention. and connection is made to the BMW WEB server. action may proceed in one of several ways. In one embodiment. the TV display is suspended, and the
25   initial WEB page downloaded from the BMW server is displayed instead. Preferably. the TV display continues. and the WEB page downloaded is displayed in a window 71 over the TV display as shown in Fig. 2C. In this manner. window 71 can be enlarged or downsized, moved on the screen. and closed whenever the viewer wishes. Also, interactive areas in
30   the window relating to additional information or related WEB pages can be activated with cursor 70 and selector buttons 69. just as though the WEB page in the superimposed window is a page displayed on a computer monitor via a conventional WEB browser. This capability includes ability to scroll via scroll bars and the like as commonly presented with WEB
35   pages on the WWW. In some embodiments, due to areal limitations for display. rather than sizing a WEB page to a window for display, the WEB page is maintained at a certain minimum size. and if the window is too

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In a minimum embodiment, a URL may be associated in an inter-
frame region. as described above. and, upon selection of the image. the
URL may be displayed on the screen as text information for the viewer to
remember or copy. The URL may also be downloaded to a memory
5   device for later printout or use in browsing.

There are an almost endless list of adaptations and embodiments of
this invention. The example of the BMW advertisement is a commercial
application, and one may imagine a multitude of such commercial
advertising applications.

10   In other embodiments, for example, in TV programs other than
advertisements. actors and actresses may be associated with URLs which
-will lead to WEB pages with information such as other movies or
presentations featuring the same person. biographical information.
availability and preferences for additional work (for agents and the like).

15 In politics, positions on issues. coming rallies and campaign stops. and the
like may be accessed from political spots having an active region
according to the invention. In sports events. information about particular
athletes may be provided. and information about schedules. upcoming
contests, records. chances of playoff positions, and the like may be
20   — presented. Sports organizations may also present season ticket prices and
the like. and even accomplish sales over Internet links.

Fig. 3A is a flow diagram depicting a procedure followed by an
apparatus in conjunction with a data stream containing a dynamic URL in
conjunction with an embodiment of the present invention.

25   At step 83 a data stream is received bearing entity data and one or
more dynamic URLs in a data region separate from image frame data.
The one or more URLs are linked to the image entities by a tag. The
URLs can be sent before (ahead of) the images and stored in a cache.
Thus. when many images are displayed at the same time, more bandwidth
30   can be alloated to the entities. as opposed to the URL data.

At step 85 interframe data is stripped and provided to computer
elements in the receiving platform (see Fig. 1) to a CPU executing
dynamic URL control routines according to an embodiment of the present
invention at step 87. A normal TV picture is presented from the frame
35   data at step 89 by the conventional TV elements of the receiving
interactive system.

example above, is identified in a scene to be broadcast. to be associated with a dynamic URL.

At step 75 the identified entity is associated with a URL. The URL will in most cases be for a WEB page maintained for the purpose of providing additional information related to the identified entity. or associated with the TV broadcast in a more general way.

At step 77 the location and, in many cases, the areal extent of the identified entity is identified for a broadcast frame relative to frame geometry. That is, the position and extent of the entity on a display screen.

At step 79 data defining the position and areal extent of the identified entity. and a URL to be associated with the entity, is recorded in a data region separate from the image data for display frame in the data stream for a broadcast. The separate data region is associated with the frame.

In step 81 steps 1-4 are repeated for all frames wherein an entity is to be associated with a dynamic URL. In most cases one entity will be repeated in a relatively large number of frames. so a viewer will have time to react and select a dynamic entity. In a single program or broadcast several entities may be thus associated with a single, or with several URLs.

Any entity is a candidate, and there are many possibilities. People may be selected, objects or artifacts. or added icons or images for example. In some cases the entity to be identified and associated with a URL is actually added to the scene by added data in the same region used for the URL. In some embodiments as well, a single (point) position is identified for an entity, and a general area. such as a circular area or a rectangular area is associated with the entity, to be the area which a viewer may select to initiate a dynamic URL.

The invention is not limited to pre-recorded and edited image data. Unique methods may be employed to provide the advantages of the present invention in live broadcasts. such as sports events and the like. In live broadcasts the data between frames, including a URL associated with an image, has to be inserted in substantially real time, or with a minimum delay. This means that the transmission equipment. meaning a camera and associated image and data processing apparatus, has to have a way of knowing which object or person being imaged is to be an URL-associated

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In addition to the above, although TV broadcast from a remote location by any one of several methods, either live broadcast or pre-recorded, has been used primarily as examples for described embodiments above, the invention also encompasses other ways of providing TX signals to a display, and the integrated ability to respond to dynamic URLs. For example, TV programming with associated URLs may be provided on video tape to be used in a VCR, by signals stored on one of the hard disk drives, or by signals provided on a CD-ROM disk to be played in the CD-ROM drive shown in Fig. 1. The invention is broad enough to encompass any means of providing signals for TV display, with the signals integrated with a dynamic URL for allowing a user to browse the Internet WWW as a result of interacting with an enhanced entity in a frame of a TV display.

Still further, there are many ways the functionality of the control routines required for such an apparatus, for stripping interframe data and for accomplishing browsing in response to dynamic URLs, may be provided. It is well known in the computer arts that specific functionality may be provided by control routines written in a variety of ways. It is not the specific order of code that is unique, however, rather the functionality that the code provides for the apparatus.

There are a large body of potential applications for the invention described in several embodiments herein. Each of such applications may be regarded as a new embodiment of the present invention rather than as a new invention.

There are, in addition, many formats for display of WEB pages with simultaneous display of TV programming, and the many variations possible simply attest to the breadth of the present invention.

receiving and display apparatus adapted for receiving and displaying the image frame data on a display monitor, the receiver and display apparatus comprising also an Internet Browser;

wherein the receiver strips the URL from the region separate from the region comprising the image frame data, activates the Internet Browser, accesses a World Wide Web home page associated with the URL, and displays the home page on the display monitor.

9. A system as in claim 8 wherein the URL is associated with an image entity in a frame displayed from the image frame data.

10. A system as in claim 8 wherein more than one entity in the display is associated with a URL.

11. A system as in claim 9 wherein the image entity is enhanced in the display to indicate to a viewer that the image entity is associated with a URL.

12. A system as in claim 10 wherein the enhancement is by one of adjusting brightness or contrast, by adjusting color, or by adding an outline to the entity.

13. A system as in claim 8 wherein the source is a broadcast transmitter broadcasting a TV signal.

14. A system as in claim 8 wherein the source is a Video Cassette Recorder (VCR) playing a VCR tape.

15. A system as in claim 8 wherein the source is a CD-ROM drive playing a CD-ROM disk.

16. A system as in claim 8 wherein the source comprises a computer apparatus retrieving and transmitting a data stream from a hard disk drive.

17. A system as in claim 8 wherein the WEB page is displayed as a movable and adjustable window on the display monitor.

by the data stream.

25. The apparatus of claim 24 wherein the enhancement is by one or more of adjusting brightness, contrast, or color.

5

26. A method for providing association of an entity in a broadcast image with an Internet Universal Resource Locator (URL), comprising steps of:

(a) preparing a data stream having frame data regions comprising sequential frame data from a scene using a visual imaging apparatus;

10   (b) inserting data for the URL in second regions between the frame data regions: and

(c) inserting data relating the URL to a specific entity in an adjacent frame data region in the second regions between the frame data regions.

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27. The method of claim 26 wherein steps (b) and (c) are steps performed in editing pre-recorded image data.

28. The method of claim 26 wherein steps (b) and (c) are performed
20   automatically in a live broadcast by computerized apparatus coordinated with the visual imaging apparatus.

29. The method of claim 26 further comprising a step for inserting data in the second regions for enhancing display of the entity.

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30. A method for associating an entity in an image displayed from a broadcast data stream with an Internet Universal Resource Locator (URL), comprising steps of:

(a) displaying image frames derived from a data stream having
30   image frame data;

(b) acquiring the URL and association data from data regions separate from but interleaved with the image frame data: and

(c) associating the entity in successive image frames with the acquired URL according to the association data.

35

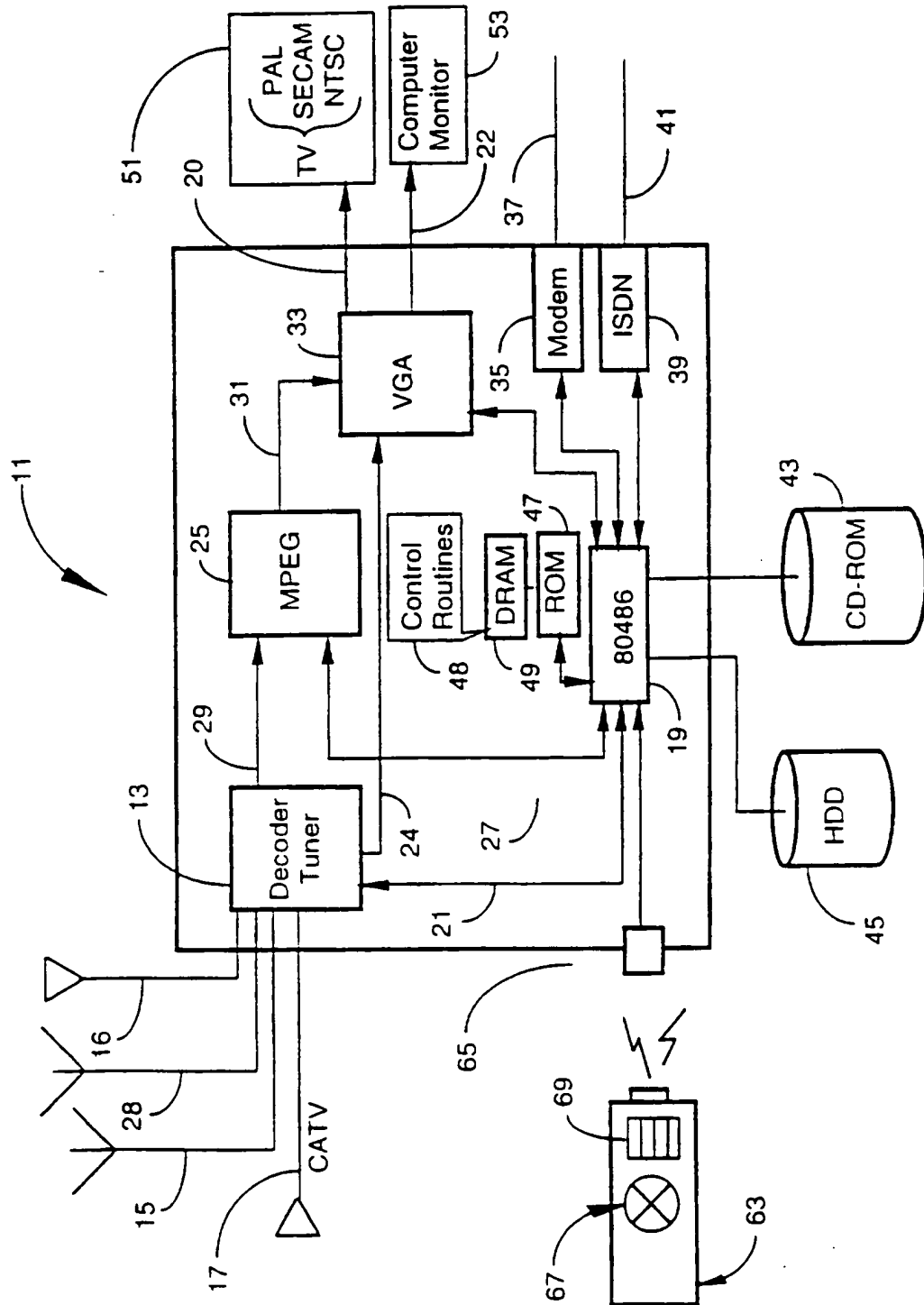31. The method of claim 30 comprising a further step of visually enhancing the entity in the successive image frames.
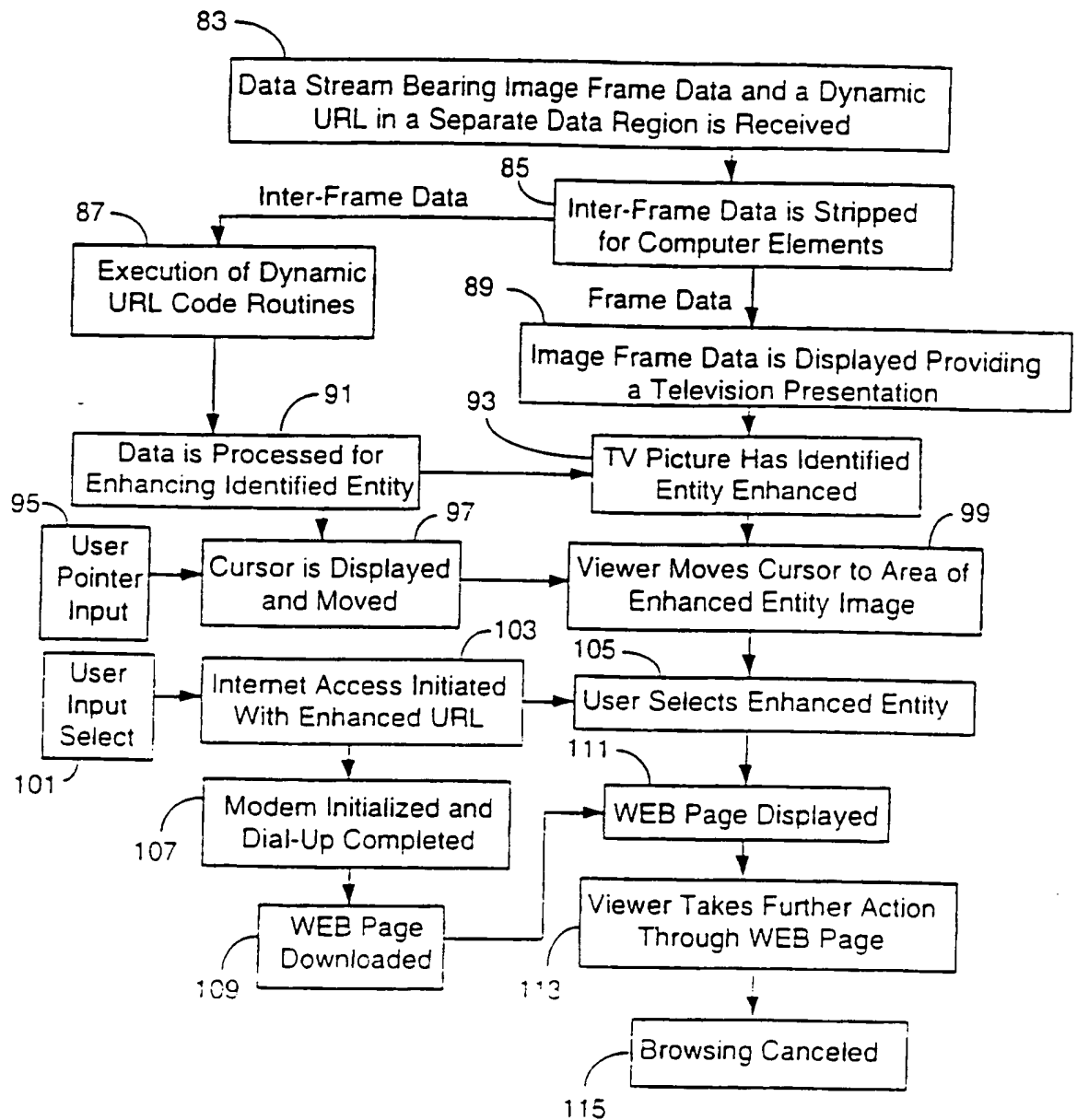
Fig. 1

83 —
┌───┐
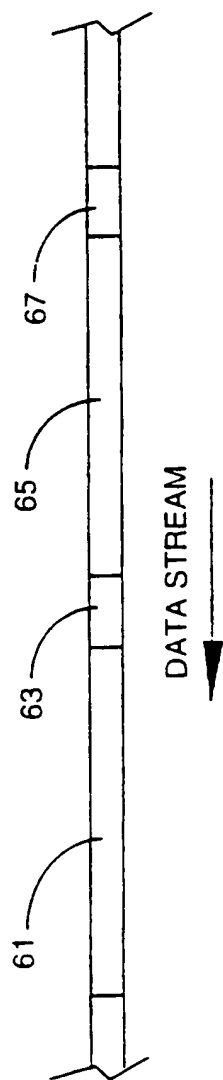│ Data Stream Bearing Image Frame Data and a Dynamic │
│ URL in a Separate Data Region is Received │
└───┘

85

Inter-Frame Data

87 —
┌─────────────────────────────┐   ┌─────────────────────────────┐
│ Execution of Dynamic   │   │ Inter-Frame Data is Stripped │
│ URL Code Routines   │   │ for Computer Elements   │
└─────────────────────────────┘   └─────────────────────────────┘

89 — Frame Data

┌───┐
│ Image Frame Data is Displayed Providing   │
│ a Television Presentation   │
└───┘

91   93

┌─────────────────────────────┐   ┌─────────────────────────────┐
│ Data is Processed for   │──────▶ │ TV Picture Has Identified   │
│ Enhancing Identified Entity │   │ Entity Enhanced   │
└─────────────────────────────┘   └─────────────────────────────┘

95 —   97   99

┌──────────┐   ┌─────────────────┐   ┌─────────────────────────────┐
│ User   │   │ Cursor is Displayed │──▶│ Viewer Moves Cursor to Area of │
│ Pointer │──▶ │ and Moved   │   │ Enhanced Entity Image   │
│ Input   │   └─────────────────┘   └─────────────────────────────┘
└──────────┘

                        103   105

┌──────────┐   ┌─────────────────────┐   ┌─────────────────────────────┐
│ User   │   │ Internet Access Initiated │─▶│ User Selects Enhanced Entity │
│ Input   │──▶ │ With Enhanced URL   │   └─────────────────────────────┘
│ Select   │   └─────────────────────┘
└──────────┘

101   111

┌─────────────────────────┐   ┌─────────────────────────┐
│ Modem Initialized and   │   │ WEB Page Displayed   │
│ Dial-Up Completed   │   └─────────────────────────┘
└─────────────────────────┘

107   ┌─────────────────────────────┐
                                    │ Viewer Takes Further Action │
┌─────────────────┐   │ Through WEB Page   │
│ WEB Page   │   └─────────────────────────────┘
│ Downloaded   │
└─────────────────┘   113

109   ┌─────────────────────────┐
                                    │ Browsing Canceled   │
                                    └─────────────────────────┘

                                    115

Fig. 3A

Fig. 2B

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :H04N 7/16
US CL :348/13, 10, 6; 455/6.1, 6.2, 6.3
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)
U.S. : Please See Extra Sheet.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C.	DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	INTERNET WEEK "Joining Television And The Internet Using Java", V.2 NO. 14, Published 01 April 1996 3 pages.	1-4,8-10, 13-23,26-30 33-36 -------------- 5-7,11,12, 24,25,31,32
Y	US 5,418,576 A (ROSS) 23 May 1995 col. 1, line 65 - col. 2, line 45, col. 5, lines 20-25	5-7,11,12 24,25,31 32
A, P	US 5,570,295 A (ISENBERG ET AL.) 29 OCTOBER 1996, abstract, figures 1-4	1-36
A,E	US 5,640,193 A (WELLNER) 17 June 1997 abstract, figures 1-2	1-36

[X]	Further documents are listed in the continuation of Box C.	[ ]	See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance		
"E"	earlier document published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 JULY 1997	0 9 OCT 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer CHRISTOPHER GRANT
Facsimile No. (703) 305-3230	Telephone No. (703) 305-3900

Form PCT/ISA/210 (second sheet)(July 1992)*

B. FIELDS SEARCHED
Minimum documentation searched
Classification System: U.S.

348/13, 12, 10, 7, 6, 1, 686, 678, 687, 563, 564; 455/6.1, 6.2, 6.3, 5.1, 4.2, 3.1, 2;
H04N 7/16. 7/173

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

APS, DIALOG
search terms:URL OR (UNIFORM OR UNIVERSAL) RESOURCE LOCAT?
TV OR TELEVISION
INTERNET OR WWW OR WORLD WIDE WEB